

CLAIMS

What is claimed is:

1. An air conditioning pack for an aircraft comprising:
primary and secondary heat exchangers;
a third heat exchanger fluidly connected to said primary and secondary heat exchangers; and
a valve system selectively fluidly connecting said third heat exchanger with at least one of said primary and secondary heat exchangers in response to a command from a controller, said valve system fluidly connecting said third and primary heat exchangers to provide a first cooling capacity, and said valve system fluidly connecting said third and secondary heat exchanger to provide a second cooling capacity different than said first cooling capacity.
2. The pack according to claim 1 comprising an air cycle machine fluidly connected to said heat exchangers.
3. The pack according to claim 2 comprising a humidity control system fluidly connected between said heat exchangers and said air cycle machine.

4. The pack according to claim 2, wherein said first cooling capacity corresponds to a high altitude/cruise condition with air from said primary heat exchanger flowing into said third heat exchanger, and said second cooling capacity corresponds to a hot day/ground condition with air from said secondary heat exchanger flowing into said third heat exchanger.

5. The pack according to claim 4, wherein said first cooling capacity is provided by a portion of air in said third flowing to a pack outlet for distribution, and another portion of air in said primary flowing to a compressor of said air cycle machine and from said compressor to said secondary heat exchanger, and air flowing from said secondary heat exchanger through a humidity control system to a first turbine of said air cycle machine.

6. The pack according to claim 5, wherein said first cooling capacity is provided by air flowing from said first turbine of said air cycle machine through said humidity control system to a second turbine of said air cycle machine and to said pack outlet for distribution with air from said third.

7. The pack according to claim 4, wherein said second cooling capacity is provided by air flowing from said primary heat exchanger through a compressor of said air cycle machine to said secondary heat exchanger.

8. The pack according to claim 7, wherein said second cooling capacity is provided by air flowing from said third through a humidity control system to a first turbine of said air cycle machine, and air flowing from said first turbine through said humidity control system to a second turbine of said air cycle machine and to said pack outlet for distribution.
9. The pack according to claim 2, wherein said air cycle machine is a three wheel machine having a compressor and two turbines.
10. The pack according to claim 1, wherein said valve system includes a first valve arranged between said primary and third heat exchangers, said first valve in an open position permitting fluid flow between said primary and third heat exchangers when providing said first cooling capacity and in a checked position regulating fluid flow between said primary and third heat exchangers when providing said second cooling capacity.
11. The pack according to claim 1, wherein said valve system includes a second valve arranged between said secondary and third heat exchangers, said second valve in an open position permitting fluid flow between said secondary and third heat exchangers when providing said second cooling capacity and a closed position preventing fluid flow between said secondary and third heat exchangers when providing said first cooling capacity.
12. The pack according to claim 1, wherein said heat exchangers are arranged in a ram air duct.